

DEVELOPMENT AND APPLICATION OF INDICATORS FOR MONITORING COASTAL RESPONSE TO EFFLUENT DIVERSION INTO MASSACHUSETTS BAY

Carlton D. Hunt, Ph.D.

Battelle, 397 Washington St., Duxbury, MA

Biographical Sketch of Author

Carlton Hunt is a Research Leader in Battelle's Duxbury, MA office where his chemical oceanographic and ecological background is applied to a variety of estuarine and coastal assessment and monitoring and remediation projects. He currently supports the Massachusetts Water Resources Authority on its nationally recognized Harbor and Outfall Monitoring program. As technical director for the largest outfall-monitoring program in United States coastal waters, he oversees more than twenty-five field, laboratory, database, and scientific experts addressing outfall related water quality, nutrient, contaminant, fish and shellfish, and benthic community measurements. He also plans and facilitates monitoring workshops for the USEPA's National Estuary Program.

Abstract

In 1992 the Massachusetts Water Resources Authority implemented an extensive monitoring program to evaluate the response of Massachusetts Bay to diversion of its effluent into offshore Massachusetts Bay. When the outfall came online in September 2000, nine years of baseline data on the quality of water and sediments and biological communities that inhabit Boston Harbor and Massachusetts Bay had been gathered. In response to regulatory reviews, MWRA developed a Contingency Plan to address how treatment plant operations could be modified to respond to any problems indicated by monitoring. Implementation of the Contingency Plan required the development environmental indicators suitable for early detection of unacceptable responses in the coastal waters. Approximately 40 effluent, water, sediment, and biological characteristics were identified as key indicators of the key ecological components and functions within the bay system and potential environmental responses. These indicators have been given numeric values that can trigger specific responses, if exceeded and set quantitative boundaries for acceptable environmental change. The strategy and approach used to design and implement this indicator/threshold approach and the application of these indicators and responses are described. The effectiveness of the approach over the first year of post-diversion monitoring in Massachusetts Bay is also considered.